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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HISATO SHINOHARA and AKIRA SUGAWARA

Appeal 2009-015419
Application 08/169,127
Technology Center 1700

Before CHUNG K. PAK, TERRY J. OWENS, and JEFFREY T. SMITH,
Administrative Patent Judges.

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL¹

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 61-80, 91-94, 101, 104-107, 131, and 140-180, which are

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

¹ US 5,130,291 to Okuda issued July 14, 1992.

all of the pending claims. The sole rejection of claims 176-180 (under 35 U.S.C. § 112, first paragraph, written description requirement) is withdrawn in the Examiner's Answer (pp. 2-3). We have jurisdiction under 35 U.S.C. § 6(b).

The Invention

The Appellants claim methods for making an active matrix display device and a plurality of thin film transistors. Claim 61 is illustrative:

61. A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a substrate;

forming a non-single crystalline semiconductor layer;

providing a first laser beam having a first cross section;

expanding said first cross section of the first pulsed laser beam along a first direction;

condensing the expanded laser beam along a second direction orthogonal to said first direction;

irradiating the non-single crystalline semiconductor layer with the condensed laser beam having a second cross section at a surface of the non-single crystalline semiconductor layer wherein a length of said second cross section along said first direction is longer than that of said first cross section and a width of said second cross section along said second direction is smaller than that of said first cross section;

moving a relative location of said substrate to the condensed laser beam along a third direction orthogonal to said first direction while irradiating the non-single crystalline semiconductor layer with the condensed laser beam whereby the non-single crystalline semiconductor layer is crystallized; removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors for the active matrix circuit and said driving circuit.

The Reference

Shinohara 6,261,856 B1 Jul. 17, 2001

The Rejections

The claims stand rejected as follows: claims 61-65, 71-75, 91, 144, 151, 155-163, 166, 167, and 173-175 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Appellants regard as the invention; claims 61-65, 71-75, 91, 144, 151, 155-163, 166, 167, and 173-175 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement; claims 61-65 and 71-75 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement; and claims 61-80, 91-94, 101, 104-107, 131, and 140-175 under the judicially created doctrine of obviousness-type double patenting over claims 1-30 of Shinohara.

OPINION

We reverse the rejections under 35 U.S.C. § 112, first paragraph, and affirm the obviousness-type double patenting rejection.

Rejection under 35 U.S.C. § 112, second paragraph

Issue

Have the Appellants indicated reversible error in the Examiner's determination that "removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer" would have been indefinite to one of ordinary skill in the art?

Analysis

“[T]he indefiniteness inquiry asks whether the claims ‘circumscribe a particular area with a reasonable degree of precision and particularity.’”

Marley Mouldings Ltd. v. Mikron Industries Inc., 417 F.3d 1356, 1359 (Fed. Cir. 2005), quoting *In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971).

The Examiner argues that “removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer” is indefinite because “it is unclear from the claim language where this silicon oxide layer comes from, since it was never claimed to be deposited, hence it is unclear how one can remove something that does not necessarily exist” (Br. 4). The Examiner argues that it is not clear whether the silicon oxide layer is formed before the non-single crystalline semiconductor layer is irradiated, is formed by oxidation during the irradiation, or is a masking layer. *See id.*

The Appellants point out that their Specification discloses that “the semiconductor layer is covered by an insulating layer 59 made of silicon oxide or silicon nitride” (Spec. 11, 3-6), and that “[a]fter the crystallization, the insulator 59 is etched off” (Spec. 12:1) (Reply Br. 6-7, 10). Regarding the formation of the silicon oxide layer the Appellants argue that “[t]he claim intentionally omits this feature, is intended to broadly claim the invention with respect to this feature, and is abundantly clear that the source of the silicon oxide is not a critical feature of the claimed invention.” *See id.*

The Examiner’s argument that “it is unclear how one can remove something that does not necessarily exist” (Ans. 4) is not well taken because the recitation in the Appellants’ claims that an insulating layer is removed indicates that the insulating layer exists prior to removal. The claims do not

recite how the silicon oxide layer is formed and, therefore, broadly encompass every manner of forming the silicon oxide layer. The breadth of the claims, however, does not render them indefinite. *See In re Gardner*, 427 F.2d 786, 788 (CCPA 1970) (“Breadth is not indefiniteness”). The Examiner has not established that even if the Appellants’ silicon oxide layer can be formed in any of the ways argued by the Examiner (Ans. 4), one of ordinary skill in the art would not have known what it means to remove such a layer.

Conclusion of Law

The Appellants have indicated reversible error in the Examiner’s determination that “removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer” would have been indefinite to one of ordinary skill in the art.

Rejections under 35 U.S.C. § 112, first paragraph

Issue

Have the Appellants indicated reversible error in the Examiner’s determination that the Appellants’ original disclosure fails to provide written descriptive and enabling support for “removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer”?

Analysis

The Examiner argues that the Appellants’ original disclosure “does **not reasonably provide enablement for** removal of ‘an insulating layer comprising silicon oxide’ from an unknown source in an uncertain relationship to the irradiation step itself” (Ans. 5).

The Appellants argue that “it would not require undue experimentation to understand that the present invention supports and enables removal of any insulating layer comprising silicon oxide from an upper surface of a crystallized semiconductor layer” (Reply Br. 9).

A specification complies with the 35 U.S.C. § 112, first paragraph, enablement requirement if it allows those of ordinary skill in the art to make and use the claimed invention without undue experimentation. *See In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993); *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1576 (Fed. Cir. 1984). The Examiner has not established that even if the Appellants’ silicon oxide layer can be formed in any of the ways argued by the Examiner (Ans. 4), one of ordinary skill in the art would not have been able to carry out the claimed method without undue experimentation.

The Examiner argues that the Appellants’ claims are broader than the scope of the enabling disclosure and, therefore, lack adequate written descriptive support (Ans. 5).

The Appellants argue that “it is wholly inappropriate to extend the written description requirement to include all possible variations that fall within the scope of a given claim” (Reply Br. 6).

For an applicant to comply with the 35 U.S.C. § 112, first paragraph, written description requirement, the applicant’s specification must “convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention.” *Carnegie Mellon University v. Hoffmann-La Roche Inc.*, 541 F.3d 1115, 1122 (Fed. Cir. 2008), quoting *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991). The Appellants’ original disclosure indicates that the Appellants

were in possession of a method wherein a silicon oxide layer is removed from an upper surface of a crystallized semiconductor layer, i.e., “[a]fter the crystallization, the insulator 59 is etched off” (Spec. 12:1). The Examiner has not established that even if the Appellants’ silicon oxide layer can be formed in any of the ways argued by the Examiner (Ans. 4), the Appellants’ original disclosure would have failed to indicate possession of a method wherein the silicon oxide layer is removed.

Conclusion of Law

The Appellants have indicated reversible error in the Examiner’s determination that the Appellants’ original disclosure fails to provide written descriptive and enabling support for “removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer”.

Obviousness-type double patenting rejection

Issue

Have the Appellants indicated reversible error in the Examiner’s determination that under the doctrine of obviousness-type double patenting the Appellants’ argued claim limitations do not distinguish the Appellants’ claims over those of Shinohara?

Analysis

The Appellants argue that the step of “removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer” distinguishes the Appellants’ claims 61, 71, and 151 over the claims of Shinohara (Br. 22).

In an obviousness-type double patenting determination the patent’s disclosure, in certain instances, “may be used as a dictionary to learn the

meaning of terms in a claim.” *See In re Vogel*, 422 F.2d 438, 441 (CCPA 1970).

Shinohara’s claim 1 recites “forming a plurality of thin film transistors using the crystallized semiconductor film as at least channel regions of the thin film transistors.” Shinohara’s Specification indicates that “forming a plurality of thin film transistors” means removing a silicon oxide layer (59) from a plurality of crystallized semiconductor islands (59), forming a gate insulating layer (53), forming a gate electrode (56) on the gate insulating layer (53) over each island (59), and doping each island (59) using the gate electrode (56) as a mask so as to form source and drain regions (57) in each semiconductor island (58) (col. 6, ll. 11-23; Fig. 7D). Hence, one of ordinary skill in the art would have interpreted Shinohara’s claim 1 term “forming a plurality of thin film transistors” as including the step of “removing an insulating layer comprising silicon oxide from an upper surface of the crystallized semiconductor layer” in the Appellants’ claims 61, 71, and 151. Because Shinohara’s claim 1 and the Appellants’ claims 61, 71, and 151 differ in scope, the proper double patenting rejection is obviousness-type double patenting. *See Vogel*, 422 F.2d at 441 (“By ‘same invention’ we mean identical subject matter. Thus the invention defined by a claim reciting ‘halogen’ is not the *same* as that defined by a claim reciting ‘chlorine,’ because the former is broader than the latter”).

The Appellants argue that the step of “moving a relative location of said substrate to the condensed laser beam along a third direction orthogonal to said first direction” distinguishes the Appellants’ claims 66, 76, and 152 over the claims of Shinohara (Br. 22).

Shinohara's claim 1 recites "moving said substrate with respect to said laser beam in a direction [which corresponds to the Appellants' third direction] perpendicular [i.e., orthogonal] to said first direction".

The Appellants argue that the step of "forming a gate insulating film on said plurality of semiconductor islands wherein said gate insulating film covers a surface of the ion blocking film, said surface being exposed between the plurality of semiconductor islands" distinguishes the Appellants' claims 140, 153, and 164 over the claims of Shinohara (Br. 22-23).

Shinohara's claim 27 recites "forming a plurality of semiconductor islands on a blocking film" and "forming a gate insulating film on said plurality of semiconductor islands". For written descriptive support for the Appellants' claim limitation "said surface being exposed between the plurality of semiconductor islands" the Appellants rely upon their Figure 7C (Br. 8-9; fn 39) which shows that between the semiconductor islands (58, Fig. 7B) the ion blocking film (51, Fig. 7A) is covered by the gate insulating film (53). In view of Shinohara's Figure 7C one of ordinary skill in the art would have interpreted Shinohara's claim 27 term "forming a gate insulating film on said plurality of semiconductor islands" as meaning that the gate insulating film is formed over the semiconductor islands (58) and the blocking film (51) surface between the semiconductor islands (58).

The Appellants argue that the step of "forming a plurality of [thin film transistors, claims 71 and 76; semiconductor islands, claims 164 and 165] . . . for the active matrix circuit and said peripheral circuit" distinguishes the Appellants' claims 71, 76, 164, and 165 over the claims of Shinohara (Br. 22-24).

Shinohara's claim 1 recites "forming a plurality of thin film transistors using the crystallized semiconductor film as at least channel regions of the thin film transistors, whereby both of said active matrix circuit and said driving circuit are constituted with said thin film transistors." As indicated by Shinohara's Figure 7C the plurality of thin film transistors formed using the crystallized semiconductor film as the channel regions include semiconductor islands (58, Fig. 7B). Shinohara's disclosure that "[i]t is also possible to form other semiconductor islands on the same substrate in order to form a driver circuit or peripheral circuit for driving the pixel TFTs" (col. 5, ll. 55-58) indicates that the driving circuit in Shinohara's claim 1 is, or at least would have been suggestive of, a peripheral circuit.

The Appellants argue that "wherein the condensed laser beam has a second cross section on the substrate wherein a length of said second cross section along said first direction is longer than that of said first cross section and a width of said second cross section along said second direction is smaller than that of said first cross section" distinguishes the Appellants' claims 141 and 154 over the claims of Shinohara (Br. 22-24).

The steps in Shinohara's claim 1 of "expanding said first pulsed excimer laser beam only in a first direction, condensing the expanded pulsed excimer laser beam only in a second direction perpendicular to said first direction" cause the laser beam to have a second cross section along the first direction that is longer than that of a first cross section and a width of the second cross section along a second direction that is smaller than that of the first cross section, as indicated by a comparison of Figures 2A-2D of Shinohara and the Appellants.

As stated by the Federal Circuit in *Eli Lilly and Co. v. Barr Laboratories, Inc.*, 251 F.3d 955, 967-68 (Fed. Cir. 2001), “[t]he fundamental reason for the rule [of obviousness-type double patenting] is to prevent unjustified timewise extension of the right to exclude granted by a patent no matter how the extension is brought about” (quoting *In re Van Ornum*, 686 F.2d 937, 943-44 (CCPA 1982)). The Appellants’ argued claim limitations which are within the meaning of Shinohara’s claim terms would provide such an unjustified timewise extension of the Shinohara patent.

Conclusion of Law

The Appellants have not indicated reversible error in the Examiner’s determination that under the doctrine of obviousness-type double patenting the Appellants’ argued claim limitations do not distinguish the Appellants’ claims over those of Shinohara.

DECISION/ORDER

The rejections of claims 61-65, 71-75, 91, 144, 151, 155-163, 166, 167, and 173-175 under 35 U.S.C. § 112, second paragraph, claims 61-65, 71-75, 91, 144, 151, 155-163, 166, 167, and 173-175 under 35 U.S.C. § 112, first paragraph, written description requirement, and claims 61-65 and 71-75 under 35 U.S.C. § 112, first paragraph, enablement requirement are reversed. The rejection of claims 61-80, 91-94, 101, 104-107, 131, and 140-175 under the judicially created doctrine of obviousness-type double patenting over claims 1-30 of Shinohara is affirmed.

It is ordered that the Examiner’s decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

Appeal 2009-015419
Application 08/169,127

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